

SPIROCHAETA CTENOCEPHALI, Sp.
Nov., PARASITIC IN THE ALIMENTARY
TRACT OF THE INDIAN DOG FLEA,
CTENOCEPHALUS FELIS

BY

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ON SPECIAL DUTY

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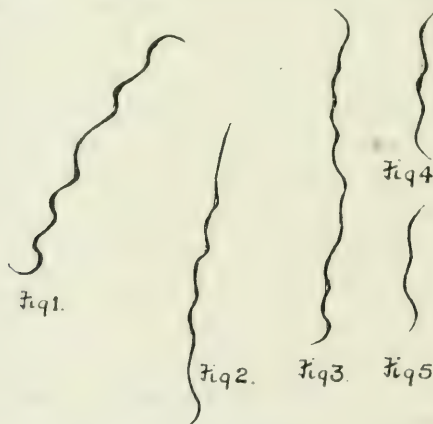
The presence of protozoa in the alimentary tracts of blood-sucking insects deserves special attention, especially when they occur in those insects which may be utilised for feeding experiments on man. In view of the recent work of Basile and others on the supposed development of the parasite of canine Kala Azar in *Ctenocephalus canis*, it is important to study all the natural parasites which may occur in the dog flea, especially in India, where, up to the present, canine Kala Azar has not been found.

In Madras the dog flea is *Ctenocephalus felis*, the species *canis* having only, so far, been found on the jackal, *Canis aureus*. *Ctenocephalus felis*, in addition to being infected with a gregarine and a herpetomonas, also contains a spirochaete. The latter parasite has been found twice in the larva of this flea, and once in the adult insect. The larvae in question were bred from fleas living on two cats which were kept in the laboratory, while the flea was taken from a dog, killed in one of the lethal chambers of Madras. In case this spirochaete may be found in *Ctenocephalus canis* in Italy, I think it will be well to describe it shortly, for there is the remote possibility that it may be mistaken for some supposed unrecognised stage of the parasite of canine Kala Azar.

It will, in the first place, be noted that this spirochaete may be found in the alimentary tract of the larva of *Ctenocephalus felis*, a fact which at once settles its origin. I have already pointed out that the larva of this flea lives almost exclusively on the excreta of the adult insect, and that the youngest as well as the oldest larvae, always contain the black digested blood passed out by the

fleas. This spirochaete has, then, nothing whatever to do with the blood, either of the dog or the cat, that is to say, it is not a parasite of these animals. Further, it should be noted that it is a rare parasite of the flea, for although about 1,500 larvae have been examined it has only been found in two, and only once out of about 500 fleas. The great rarity of this organism would tend to lead the observer to think that it possibly represented the extra-corporeal stages of a rare spirochaete of the blood of the dog or the cat. Again, the very method by which the flea acquires this parasite, namely, in its larval stage, would certainly mislead the unsuspecting observer.

In the fresh condition, this spirochaete is very active, exhibiting all the movements characteristic of this group of parasites, and which it is unnecessary to describe here. In the long forms there were from eight to ten well marked spirals, whereas in the short forms there were about four. Many of the long forms were seen dividing transversely, and I have little doubt, from what was seen in several stained specimens, that they also divide longitudinally; these methods of division have been accurately described by Fantham and Porter in the case of other spirochaetes, and I would refer the reader to their papers on this subject. Many of the long forms were seen coiled up towards their centres, or at one or the other end, an appearance which simulates, and which has been mistaken for the formation of cysts or spores. Figure 1 represents a long, stout form, in which the undulating membrane could be



Spirochaeta ctenocephali, Sp. nov.

seen as a faint pink band at the concavities of the spirals. Figure 2 represents a thinner form, and figure 3 shows such a parasite dividing transversely. Figures 4 and 5 represent short forms, in which distinct chromatic granules could be clearly made out. The long forms measured about $20\ \mu$ in length, and the short forms from $4\ \mu$ to $6\ \mu$. I propose naming this organism *Spirochaeta ctenocephali*.

REFERENCE

- FANTHAM, H. B., and PORTER, ANNIE (1909). 'The modes of division of *Spirochaeta recurrentis* and *S. duttoni* as seen in the living organisms.' Proc. Roy. Soc., B, Vol. 81, pp. 500-505.